STEAM in the Classroom

SCIENCE-TECHNOLOGY-ENGINEERING-AGRICULTURE-ART-MATH

LEMON VOLCANO

For this challenge/activity you will need:

- Plate
- Lemon
- Spoon
- Measuring Cup
- Backing Soda
- Food Coloring

Introduction:

For the month of February, we will be exploring contributions to STEM by historical African-American figures in honor of Black History Month. Before participating in this week's challenge, learn more about Biochemist, Dr. Marie Maynard Daly, who was the first African American woman to get a PhD in Chemistry and believed in breaking down the barriers that minorities faced in the scientific field.

After watching the video about Dr. Daly, follow the instructions on the next page to create your own erupting lemon volcano and learn about how acids, like lemons, have a chemical reaction when mixed with a base, like baking soda!

Information Source: *https://www.sciencebuddies.org/stem-activities/make-lemon-volcano*

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LEMON VOLCANO

Directions

1. Have an adult cut the top and bottom off of the lemon so it stands upright and place it on a plate.
2. Use a spoon to break up/partially scoop out the the inside of the lemon.
3. Add a few drops of your favorite color of food coloring inside of the lemon.
4. Pour a 1/4 cup of baking soda on top of the lemon.
5. Use the spoon to mix the baking soda with the inside of the lemon.
6. Watch you lemon volcano erupt!
7. Keep mixing with the spoon periodically and adding more baking soda, if needed to create the reaction.

Why Does This Happen?

Lemons are a kind of citrus fruit, just like limes and oranges. Citrus fruits are know for how sour they taste! These fruits taste sour because of something called citric acid. Citric acid is a chemical with lots of hydrogen ions (H+) which is what our taste buds recognize as a sour taste. Acids get rid of their hydrogen ions by reacting with other chemicals, called bases, that contain lots of hydroxide ions (OH).

Baking soda is a base, which means it contains hydroxide ions. When it comes into contact with an acid, such as a lemon, a chemical reaction starts! When an acid and a base combine (this is called an acid-base reaction), they neutralize each other. When neutralized, they release carbon dioxide (CO_2) gas, which creates the bubbles you see erupting from your volcano.

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